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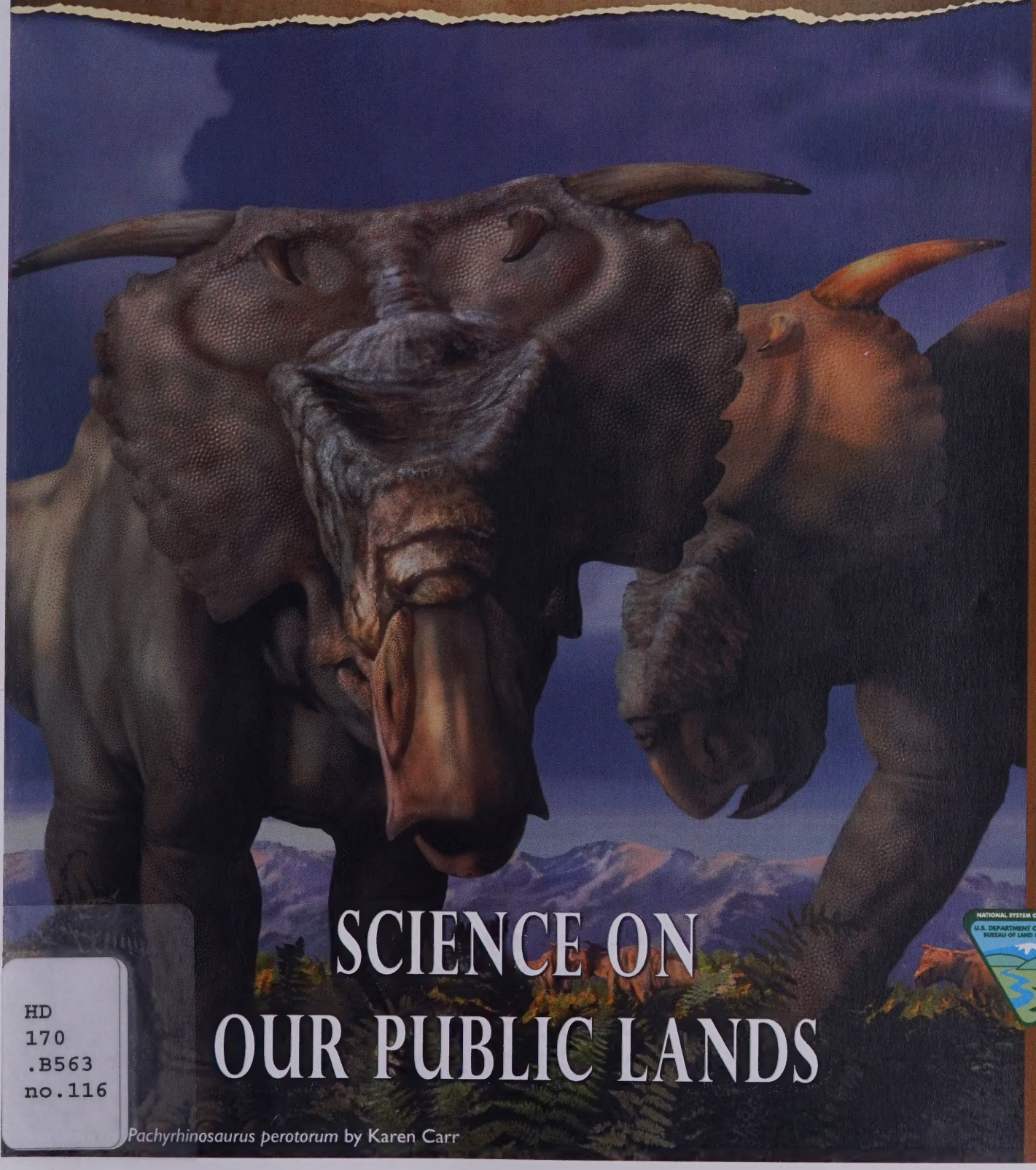

SCIENCE ON OUR PUBLIC LANDS

Pachyrhinosaurus perotorum by Karen Carr

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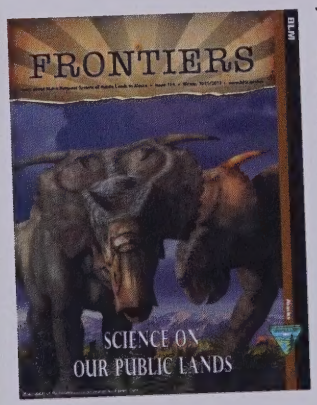
NEW LOOK!

BLM's Changing Arctic

Welcome to Frontiers



We hope you love the new look of *BLM-Alaska Frontiers*! As you can see, we've revamped our publication, creating 'bookends' to plug in news for you in the front and end of our quarterly journal, with story features in the center. We're focusing on themes with each issue.

This winter issue looks at science, climate change, and their effects on landscapes the BLM manages. Within our pages, you can meet *Pachyrhinosaurus peritorum*, a new dinosaur species; learn what's happening in the Fish Creek watershed on Alaska's arctic coastal plain; discover the outdoor laboratory on historic Nome Creek; and, explore how accelerating coastal erosion is making land disappear into the Beaufort Sea. We also bring you news bites in *Frontiers Flashes* from around the state. Feel free to drop me a line at klaubens@blm.gov to let me know what you think of our new format and stories. Thank you!

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Arctic lakes in the National Petroleum Reserve-Alaska. Photo by Matthew Whitman

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What's Happening

February

24 Eastern Interior Draft RMP/EIS releases

March

3 Iditarod Ceremonial Start at BLM Campbell Tract, Anchorage *(shown right)*

14 Kids Ice Fishing Clinic at Silver Lake, Copper River Basin

22 Red Devil Mine Tribal Consultation and Community Meetings begin in Southwest Alaska

29-31 150th Anniv. of the Homestead Act exhibit booth, Great Alaska Sportsman Show, Anchorage

April

1 Homestead Act exhibit booth continues at Great Alaska Sportsman Show, Anchorage

NPR-A Draft IAP/EIS releases

Vanessa Rathbun

What's Inside...

4 A new dinosaur discovery on BLM-Alaska lands

6 What's happening to the lakes in the NPR-A's Fish Creek Watershed?

7 There's no place like Nome Creek

8 Coastal erosion affects BLM Arctic lands

10 News Flashes from around Alaska

Back Cover
Providing data for avian malaria research

DISCOVERY

A NEW DINOSAUR DISCOVERY ON BLM-ALASKA LANDS

By Ruth McCoard

"To later realize that we had unearthed a whole new species was one of the best days of my career!"

—Dr. Anthony R. Fiorillo

It weighs about four tons, stands seven feet high on four legs, and is about 18 feet long (roughly the size of a large rhinoceros). It eats plants, is about 70-million years old, and is from the Late Cretaceous.

This is a new species of ceratopsid (horned) dinosaur, formally named the *Pachyrhinosaurus perotorum*, that Paleontologist Anthony R. Fiorillo, Ph.D., Dallas Museum of Nature and Science, and his team discovered on BLM-managed lands at the Kikak-Tegoseak Quarry near Alaska's Colville River. Although Fiorillo and his team excavated the site revealing hundreds of bones in 2006, it took more than four years of painstaking lab work and studies of the jumbled and fragmented materials before they realized what they had. Only recently did they realize the remains came from at least 10 individual *Pachyrhinosaurus* polar dinosaurs — a whole new species!

"Discovering hundreds of bones from all these *pachyrhinosaurs* in one spot was unbelievably exciting, and we really thought the expedition was an incredible success," Dr. Fiorillo explains. "To later realize that we had unearthed a whole new species was one of the best days of my career!"

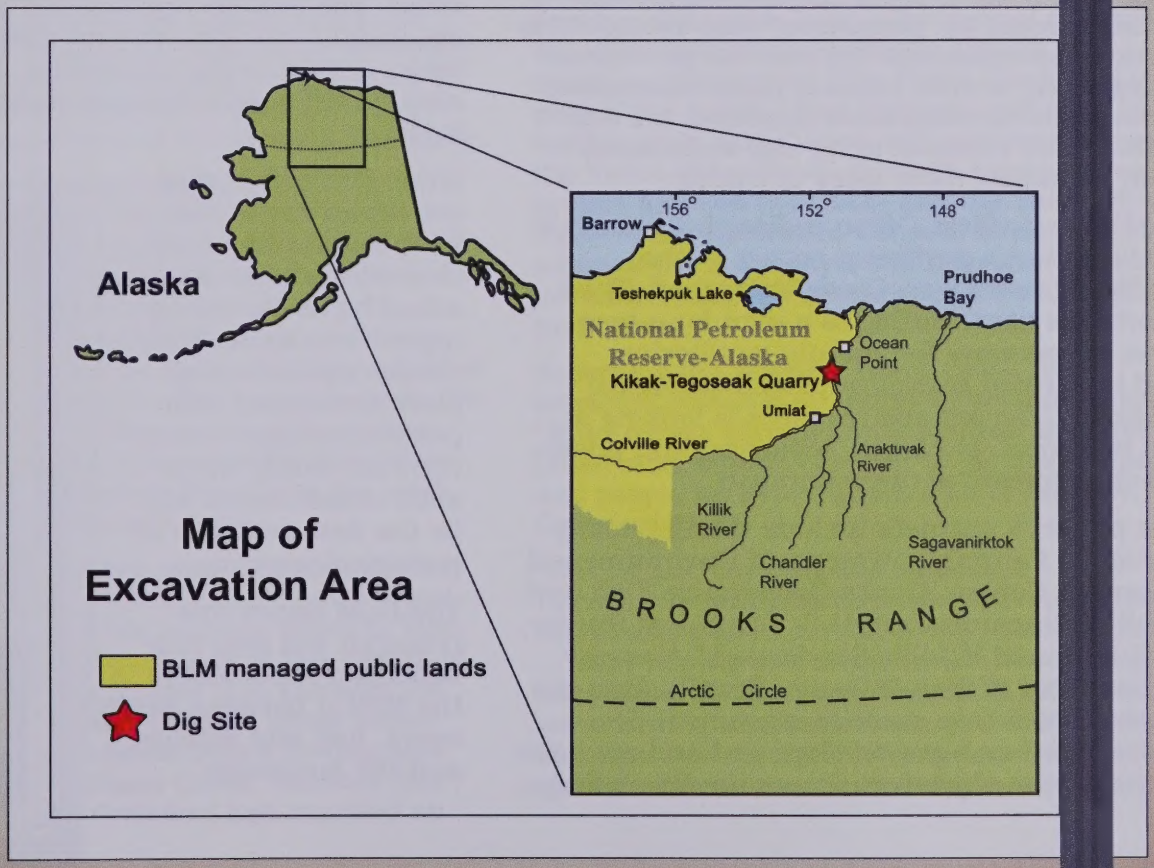
The *P. perotorum* lived in herds in an Alaska that was warmer than it is today, demonstrating that the ancient Arctic was a rich biological ecosystem. How polar dinosaurs survived in these conditions is a key research question paleontologists are still working to answer.

Fiorillo says the *P. perotorum* may have been food for *Tyrannasaurus Rex*. One of the dinosaur skulls had teeth marks from the larger carnivore dinosaur.

In December, BLM-Alaska hosted a Twitter tweet chat with Dr. Fiorillo, Dr. Tykoski and BLM Paleontologist Harley Armstrong, to answer questions about the dinosaur discovery and paleontology on BLM lands in Alaska. You can read the transcript and discover more about *P. perotorum* here:

http://www.blm.gov/ak/st/en/info/newsroom.html

http://natureandscience.org/information/pdf/press_room/102811_pachyrhinosaurus



(Left) Dr. Fiorillo's team excavating dinosaur bones along the Colville River in the National Petroleum Reserve-Alaska. Photo courtesy of the Museum of Nature & Science in Dallas.

Courtesy of the Museum of Nature & Science in Dallas

STUDIES

WHAT'S HAPPENING TO THE LAKES IN NPR-A'S FISH CREEK WATERSHED?

By Matthew Vos

Spanning 23 million acres, the National Petroleum Reserve in Alaska (NPR-A) hosts the greatest display of migratory wildlife in North America. Millions of shorebirds and waterfowl migrate from every continent and ocean to breed on the vast NPR-A's wetlands. Nearly 500,000 caribou also migrate to the NPR-A to calve, escape predators and find relief from biting insects. Polar bear, muskoxen, arctic fox, and 16 species of fish also live here; yet we know little about the impacts humans have on this area.

The NPR-A lies on Alaska's arctic coastal plain, stretching from the Brooks Range to the sea. Ice and snow cover the reserve most of the year. As spring arrives, warmer temperatures cause the ice and snow to melt and flow north to the Arctic Ocean via countless streams, lakes and rivers. Underneath the NPR-A's surface, the ground remains frozen as "permafrost" year-round. With arctic temperatures on the rise, the permafrost is beginning to melt, causing rapid fluctuations throughout the watershed. Scientists are integrating their research to try and understand what is causing these lakes to change.

BLM's Arctic Field Office is directing research in the NPR-A's northeast corner in the 1,859,540-acre Fish Creek watershed. Their efforts are contributing to a plan for a long-term observatory for aquatic monitoring and integrated hydrological and ecological research. The aquatic research is looking at the biological, chemical, ecological and physical components of the watershed.

The project's partners include the University of Alaska Fairbanks Water and Environmental Research Center, Alaska Cooperative Fish and Wildlife Research Unit, U.S. Geological Survey, U.S. Fish and Wildlife Service, and Alaska Department of Fish & Game. Results from the research will help guide management decisions for oil and gas development and resource conservation objectives across the North Slope.

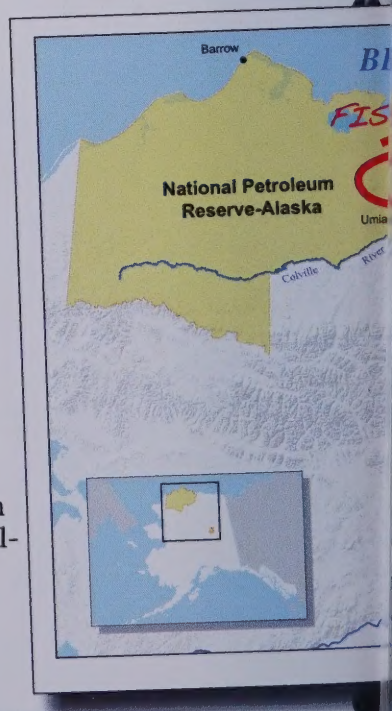
Fish Creek area lakes now flowing into one another.

BLM Arctic Field Office Fisheries Biologist Matthew Whitman and Hydrologist Richard Kemnitz are combining efforts with BLM's research partners to monitor the Fish Creek watershed and its lakes. Whitman explains that their goal is to "learn from our monitoring. We will (hopefully) have a better grip on the direction of things in another five-to-ten years."

The research includes weather and permafrost monitoring stations on eight streams and six lakes. The monitoring data will give researchers insight into how stream channels form and lakes change in the watershed. The stations also record depth changes in the permafrost layer.

Other wildlife studies are underway in the NPR-A to understand how various species are adapting to the changing environment. With roads, pipelines and pads associated with petroleum exploration, the Fish Creek Watershed observations will be the first indicator of ecological impacts.

The BLM hopes this research will lead to a beneficial relationship in the NPR-A between developers, fish and wildlife, and the landscape.



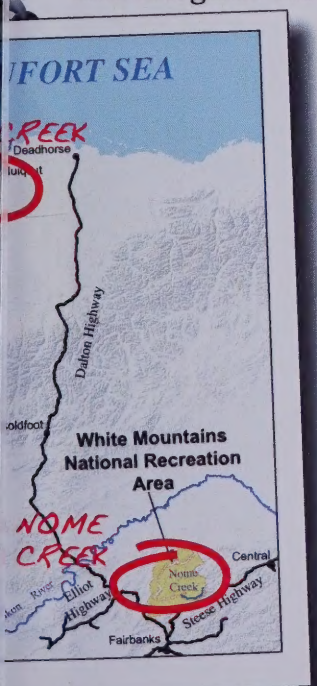
FOR CLIMATE RESEARCHERS THERE'S NO PLACE LIKE NOME CREEK

By Craig McCaa

Climate researchers have made an outdoor laboratory of this valley an hour's drive north of Fairbanks.

Ask Fairbanksans about Nome Creek and you might find a few old-timers familiar with the creek's rich gold mining history. More people will know Nome Creek as a popular family destination for berry-picking, moose-hunting and camping. Almost nobody, however, would suspect is that this unassuming creek on the southern edge of the White Mountains National Recreation Area has quietly become a hotbed of climate research.

Last July, U.S. Geological Survey (USGS) hydrologist John Crawford and his assistant Seth Spawn huddled over a brick-sized, battery-powered water pump at a research site amid an expanse of tundra and scraggly black spruce trees. With a soft putt-putt sound, the pump slowly sucked water from beneath the tundra into an assortment of carefully labeled sample bottles and vials. The samples would be analyzed in a laboratory for dissolved organic and inorganic carbon and other water chemistry.



Crawford was spending his summer studying the emission of greenhouse gases, in particular carbon dioxide and methane, from the surface of streams in Nome Creek valley. At this and other similar sites up and down the valley, he was also hoping to discover more about how carbon flows from the land into streams.

After collecting his samples, Crawford and Spawn hiked a few minutes down to West Twin Creek, a tiny ribbon of a stream that threaded its way through dense willow stands before flowing into Nome Creek. Sensors that Crawford had installed on the stream bottom were recording hourly levels of dissolved organic carbon and carbon dioxide in the water. Crawford and Spawn checked on their equipment and collected additional water samples.

BLM Hydrology Technician Eric Deal measures stream flow on Nome Creek using an Acoustic Doppler Current Profiler (a sonar device).

Crawford's work in the Nome Creek valley is part of a broader USGS research initiative to study the Yukon River Basin's response to climate change. USGS researchers have also visited Nome Creek to study how carbon is transported and recycled through the environment and to measure the storage of mercury in permafrost.

In August 2010, Nome Creek became home to yet another project—a 50-meter by 50-meter grid for annual measurement of the maximum depth of the active layer (the layer of soil that lies above permanently frozen ground and thaws each summer). The Nome Creek grid is part of the Active Layer Network, a system of similar grids established and monitored across the Yukon River Basin through a cooperative project between the USGS and the Yukon River Inter-Tribal Watershed Council. Measuring the depth of the active layer will help scientists better understand the effects of climate change on permafrost.

According to Crawford, Nome Creek has attracted research attention for several reasons. "Road access plays a pretty big role. Because we [otherwise] wouldn't be able to get the equipment and people up here without a lot of expense," Crawford says.

"But I'd also say that this landscape – this upland, not quite alpine landscape – probably represents a good portion of the Interior forest. ...We're hoping that it represents a much bigger landscape. We can't say that that's true yet, but we're hoping to get into some other sites that are like this. And we have done some work in other similar sites that we think behave similarly."

THEN and NOW

COASTAL EROSION AFFECTS BLM ARCTIC LANDS

By Vanessa Rathbun, John Payne, and Benjamin Jones

Imagine a place where coastal erosion rates are among the highest in the world—and that's increasing!

The BLM currently manages 1,154 miles of coastline on Alaska's North Slope, a coastline that makes up the northern border of the National Petroleum Reserve-Alaska (NPR-A). Coastal erosion is most noticeable from Drew Point to Cape Halkett, especially near Pogik Bay.

U.S. Geological Survey (USGS) scientist Benjamin Jones and his colleagues recently researched the average erosion rates along this segment of the NPR-A's coast. While coastline erosion is a natural process, Jones says "it appears that erosion between Drew Point and Cape Halkett is increasing." He points out that "some locations along the Drew Point to Cape Halkett stretch have eroded inland the length of nearly nine football fields between 1955 and 2009!"

The research shows that between 1955-2001, erosion rates ranged from 6-meters to 8-meters per year. The new research shows the rates from 2002-2009 eroding at a rate of 14-meters to 17-meters per year. Although sites studied vary, 60 percent show an increasing rate of erosion.

John Payne, Director of the North Slope Science Initiative (NSSI), says that "Coastal erosion is a big issue for the NSSI." He adds that "it will most likely continue to increase due to sea-level rise; decreased amounts of shorefast ice and near shore pack ice; increased depth of the active layer; warming ocean waters; and, more intense storms." The NSSI hopes to conduct more scientific studies and will continue to monitor coastal erosion.

In response to coastal erosion, the BLM plugged the J.W. Dalton (2004), Atigaru (2009), and Drew Point (2010) legacy wells in the NPR-A. Find out more: www.blm.gov/ak

Benjamin Jones (USGS)

Where the Esook Trading Post once stood.

Resources

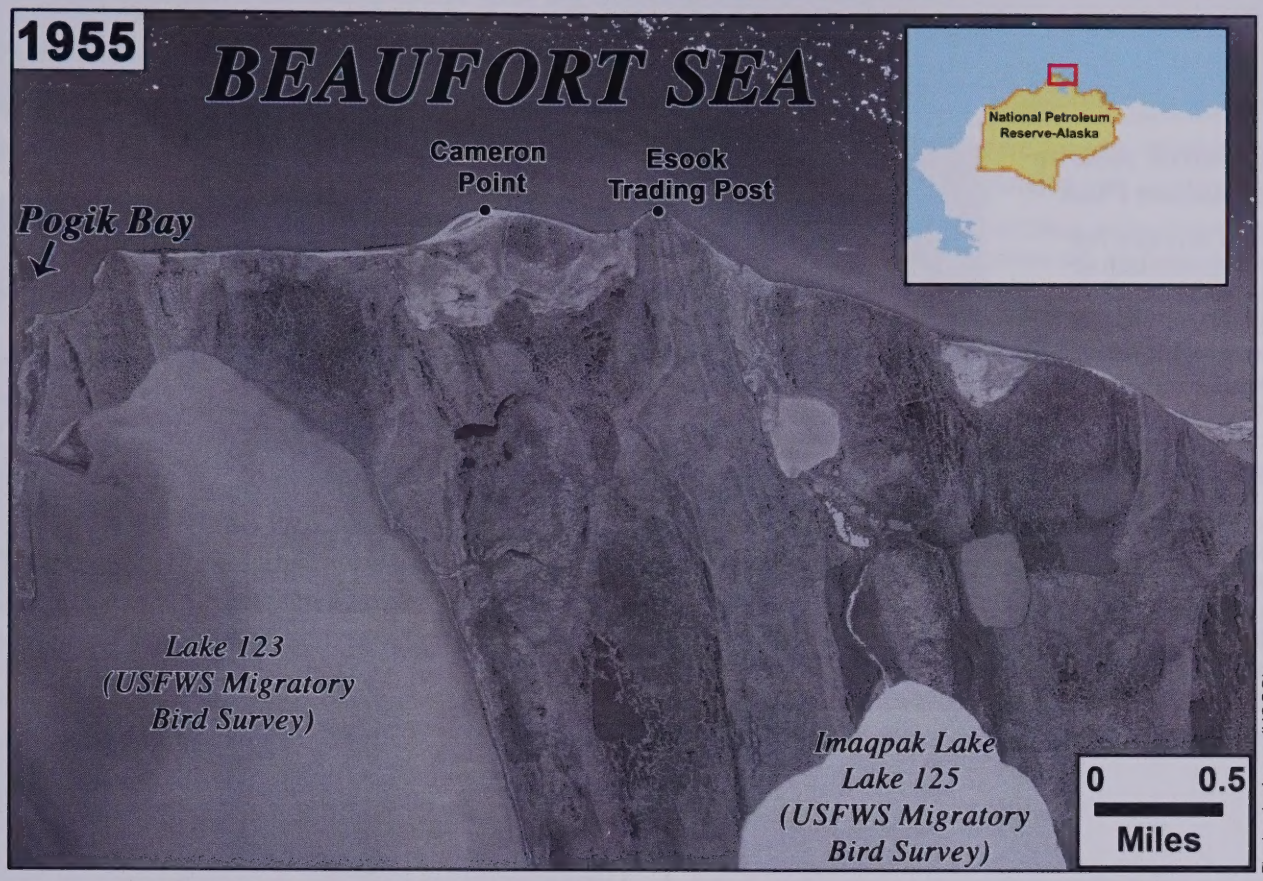
Reports, studies, and resources can be found at the North Slope Science Initiative website www.northslope.org

Talk to one of Alaska's Experts! USGS Remote Sensing Specialist Benjamin Jones, bjones@usgs.gov or (907) 786-7033

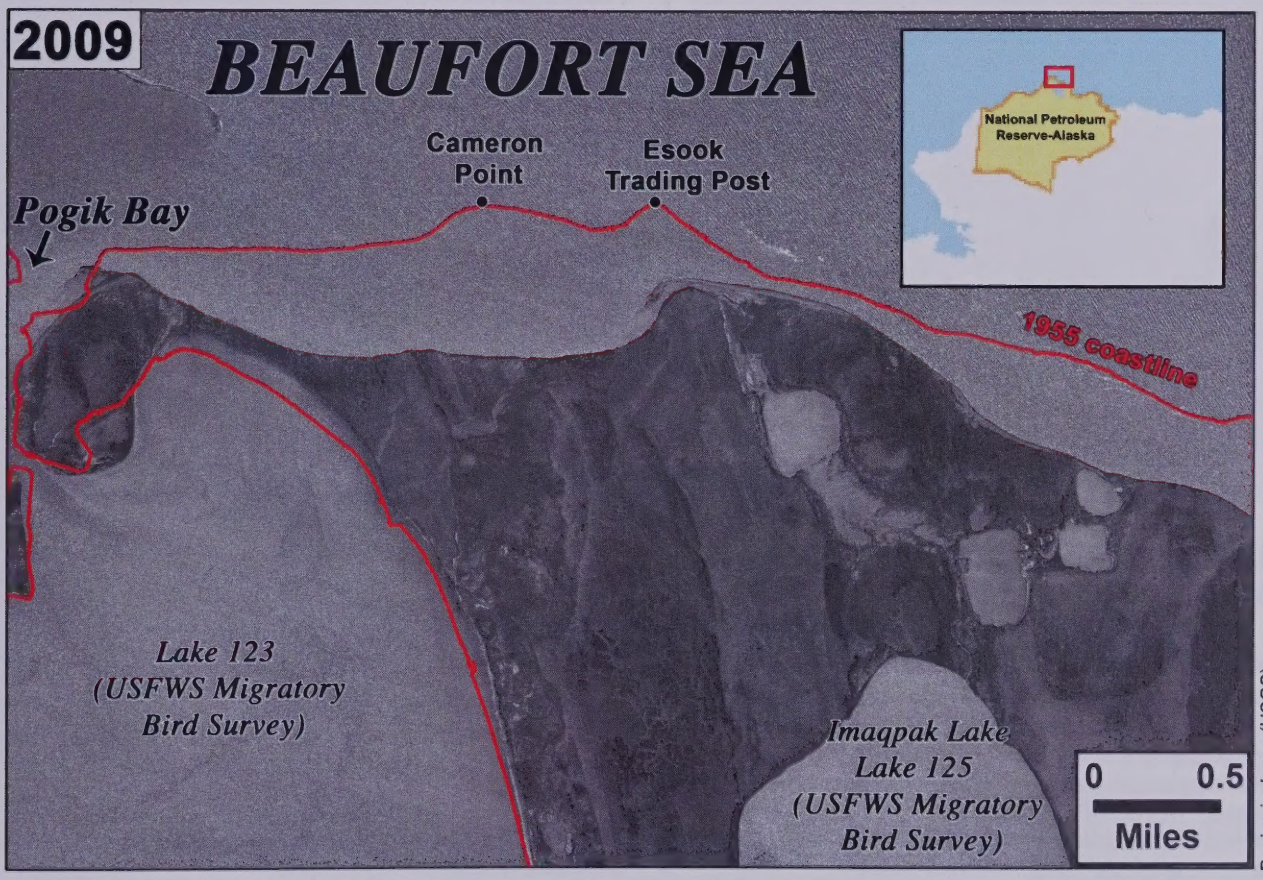
Find USGS data, studies, photos, videos and map resources at http://alaska.usgs.gov

- *Modern erosion rates and loss of coastal features and sites, Beaufort Sea coastline, Alaska.* 2008.
- *Erosional history of Cape Halkett and contemporary monitoring of bluff retreat, Beaufort Sea coast, Alaska.* 2009.
- *Increase in the rate and uniformity of coastline erosion in Arctic Alaska.* 2009.
- *Two mechanisms of aquatic and terrestrial habitat change along an Alaskan Arctic coastline.* 2010.
- *Quantitative remote sensing study indicates doubling of coastal erosion rate in the past 50 yr along a segment of the Arctic coast of Alaska.* 2007.
- *Erosion of the Barrow Environmental Observatory coastline 2003 – 2007;* 2008.

Compare the coastline on these satellite maps showing 1955 and the same area in 2009.

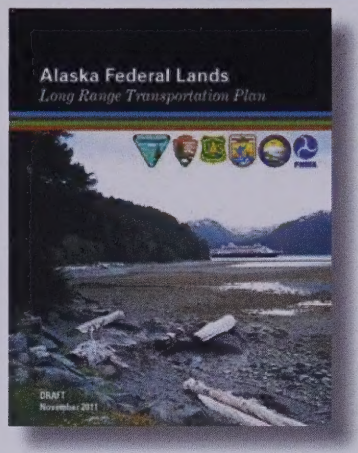


Benjamin Jones (USGS)



Benjamin Jones (USGS)

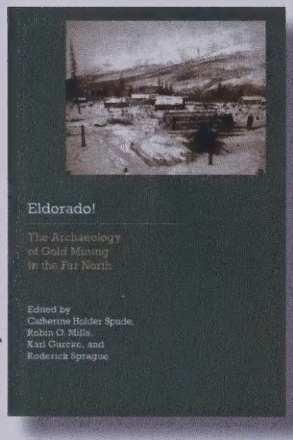
Getting there! Alaska Transportation Plan



You're invited to review and comment on a draft plan to identify and prioritize Alaska's transportation infrastructure on federal lands and its report on what transportation systems Alaska's federal lands will need in the future. For the first time, federal land management agencies in Alaska and the Alaska Dept. of Transportation and Public Facilities are jointly developing a multi-agency long-range transportation plan for Alaska's federal lands. This is your opportunity to review the draft plan. The 90-day comment period ends March 11, 2012. If you need more information, contact Randy Goodwin, (907) 474-2639, or rgoodwin@blm.gov.

- Plan Overview page www.akfedlandslrtp.org
- BLM Alaska Travel and Transportation Management website www.blm.gov/ak/st/en/prog/akcttm.html

Discover *Eldorado! The Archaeology of Mining in the Far North*



University of Nebraska Press

This new University of Nebraska Press book, *Eldorado! The Archaeology of Mining in the Far North,* features articles by BLM archaeologists Robin Mills (Eastern Interior Field Office) and Robert King (Alaska State Office). Mills also served as one of the editors. This book covers the history of mining in northern Canada and Alaska. Early reviews say the book makes a compelling case for the preservation and study of the Klondike Gold Rush. Find out more from the publisher: www.nebraskapress.unl.edu/product/Eldorado,674877.aspx

2011 NPR-A Oil and Gas Lease Sale generates $3,637,477

The Dec. 7 NPR-A sale followed a State of Alaska oil and gas lease sale for tracts adjoining the NPR-A. These sales demonstrate industry interest in areas with high resource potential along the Colville River on the North Slope. The State of Alaska will receive 50 percent of the federal receipts, or $1,818,738.50, and will also receive 50 percent of annual rental revenue for the NPR-A leases. The economic generation of bids is underway and the leases will be issued by mid-April. BLM-Alaska will hold another lease sale in late 2012.

Three Villages in Southwest Alaska receive final patents

BLM-Alaska continues work on its Alaska Native Claims Act (ANCSA) land transfer obligations. Under ANCSA, Native corporations are entitled to 45.4 million acres of federal public lands. BLM-Alaska issued these final patents in late 2011:

- 30 acres to Tanalian, Inc., the ANCSA corporation for the Native group of Port Alsworth within Lake Clark National Park.
- 156,000 acres to Togiak Native Corporation, the ANCSA corporation for the Village of Togiak within the Togiak National Wildlife Refuge.

67,356 acres to Twin Hills Native Corporation, for the village of Twin Hills located within the Togiak National Wildlife Refuge.

Ralph Eluska

On Dec 9, 2011, John Alsworth, President of the Tanalian Corp. received their final patent as part of a closing ceremony from BLM Christy Favorite and Land Transfer Adjudication Branch Chief Richard Thwaites.

Alaskans Receive Mining Awards

In 2011, the national BLM Hardrock Mineral Community Outreach and Economic Security award went to the Small Scale Mining Committee in Alaska. The award recognizes the Alaska committee for its Alaska Placer Mining Claim Operations Guide, coordinated with partners, including the BLM, USFS, and State of Alaska. The Alaska Placer Mining Claim Operations Guide is online at: http://www.blm.gov/ak/st/en/prog/minerals.html.

The national BLM Hardrock Mineral Small Operator Award went to Compass Mining, Inc., for minimizing their footprint for their underground frozen placer operations on Linda Creek near Coldfoot.

It is great to see the BLM honor these Alaskans nationally for their stewardship and outreach efforts.

FLASHES

News from around the State and our field offices

Public Lands Foundation Landscape Stewards

Denton Hamby

Area youth float the river as part of the Copper River Stewardship Program's Chitina to Cordova float trip (2009)

The Copper River Watershed Project, a partner with the BLM Glennallen Field Office, received the national 2011 Public Lands Foundation Landscape Stewardship Award. The award recognizes the project's contributions to BLM's planning efforts and work rerouting the Fish Creek trail by Paxson to reduce ATV stream crossings, constructing a salmon-viewing platform on the Gulkana River to reduce bank erosion, involving area youth and volunteers, creating a hands-on Discovery Room, and for its outstanding landscape stewardship program. Learn more at http://copperriver.org

DOI Sustainability Hero

Long-time BLMer Kurt Sorenson was honored as the 2011 Sustainability Hero during the U.S. Department of the Interior's Environmental Achievement Awards on Nov. 3 in Washington, D.C. His award recognizes his exceptional commitment during his 28-year career for reusing, reducing, and recycling to conserve the environment. As the only facility maintenance worker at BLM's Glennallen Field Office, Sorenson recycled and taught others to recycle everything – even before most people even knew about recycling! Read more at: www.doi.gov/greening/awards/2011/2011_BLMGlenallen.html

Fire in the hole! Historic Eagle cannonball provides a safety reminder

It was BLM Eastern Interior Field Office archeologist Robin Mills who received the memorable phone call. An Eagle resident had an old cannonball at her residence, and she was concerned it might still be dangerous. Mills passed the information on to the BLM's hazardous materials and safety specialists.

A flurry of calls and emails ensued as the State Troopers, the National Park Service and an explosive ordnance disposal (EOD) team from Eielson Air Force Base were brought on board. Soon the EOD team set off on a 357–mile drive to Eagle to examine the cannonball.

What the team found upon their arrival was a 12-pound iron ball roughly five inches in diameter. The cannonball was apparently found many years ago near Fort Egbert, a historic Army outpost established in 1899 to impose law and order in the Fortymile region following Interior Alaska's first gold rush.

National Park Service

Unsure whether the cannonball contained explosives, the EOD team moved it to a safe place and subjected it to a series of controlled tests, during which it exploded with no injuries or property damage.

If you encounter something you suspect to be military ordnance—no matter what kind or how old it may appear— stay away and report it to authorities.

To find out more about this topic, visit the Department of Defense's unexploded ordnance safety page. www.denix.osd.mil/uxo/

LET'S BE FRIENDS!
BLM-ALASKA IS ON FACEBOOK.
http://www.facebook.com/blmalaska

BLM-ALASKA PROVIDES DATA FOR AVIAN MALARIA RESEARCH

Teresa McPherson

Biology intern Sarah Steele has just taken blood samples and banded the black-polled warbler, and is about to release him at Campbell Tract.

By Teresa McPherson

The BLM Anchorage Field Office assisted university researchers with a study to assess avian Plasmodium (malaria) in the Arctic and the threat of global climate changes on Alaskan bird populations. "This study is the first to document that avian Plasmodium transmission occurs in the Arctic of North America," explains BLM Wildlife Biologist Bruce Seppi.

Researchers from San Francisco State University, the University of California (UCLA and UC Davis), and the Alaska Bird Observatory collected avian blood samples in Anchorage, Fairbanks and Coldfoot. Seppi and biology intern Sarah Steele collected 167 avian blood samples during 2011 fall migratory bird surveys at the Campbell Tract that became part of the data set for the study. Climate Change in the Arctic is increasing at almost twice the global rate and researchers have predicted that malaria parasites would spread to higher altitudes and northerly latitudes. The study will be published in 2012 following peer review.

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